

*Attorney Docket OHG 135***REMARKS**

Independent claims 1 and 7 are amended to recite that the high molecular-weight straight-chain organic compound is put onto the clean surface only after washing of said semiconductor substrate (by "in sequence" in the first paragraphs). This is supported in the last line on page 4 of the specification.

The claimed feature has the advantage that the clean surface of the semiconductor substrate is maintained in a convenient fashion, without requiring enormous investment for equipment or awkward (and therefore expensive) clean procedures. The Examiner is referred to the specification at page 3, lines 4 - 8.

Organic substances of low molecular weight are adsorbed onto a surface before those of high molecular weight. If a clean surface is *initially* coated with a high molecular-weight organic substance, then the probability of substitution by other substances, which can contaminate the surface, is sharply reduced (page 9, lines 4 - 13). As a result, contamination by organic substances is prevented; but at the same time, the high molecular-weight straight-chain organic compound can easily be removed later in a high-temperature processing step (page 3, lines 9 - 13). The Applicants' high molecular-weight organic substance (for example, cholesterol (boiling point 233 degree centigrade) or behenic acid (boiling point 306 degree centigrade)) acts like a protective envelope, but it needs no assembly or removal and requires no expensive equipment.

The Applicants' approach is unexpected. The person of ordinary skill would expect that low-molecular weight compounds, being more volatile, would evaporate in high-temperature subsequent processing ahead of higher-weight molecules, but the Applicants have found that the higher-weight molecules are beneficial in preventing contamination.

The Applicants now claim depositing the high molecular-weight straight-chain organic compound *after* washing, and subsequently eliminating the high molecular-weight straight-chain organic compound by heat treatment of the wafer (for example, during thermal oxidation steps or CVD steps at 500-1100 degrees centigrade, see page 5, lines 15- page 6, lines 7).

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Claims 1-3, 6-9, 12, and 22-25 were rejected under §102 over JP07-275813. This rejection is respectfully traversed.

(1) JP '813 discloses only "low-molecular weight" polyorganosiloxane, not the Applicants' claimed "high molecular-weight" straight-chain organic compound. Low-molecular weight polyorganosiloxane is mentioned in the Abstract, line 4 and ¶[0013]. In ¶[0014] the reference states that low-molecular weight polyorganosiloxane is preferred for its "good replaceability with water" and 60 °C boiling point, which is related to its low molecular weight.

(2) JP '813 discloses cleaning a semiconductor substrate using polyorganosiloxane in a washing process, as the Examiner notes at page 3, line 1. The applied paragraphs [0009]-[0013] of JP '813 repeatedly refer to washing, and polyorganosiloxane is *not* disclosed as being applied after washing, contrary to the Applicants' amended claims.

Paragraphs [44]-[47], which are also applied in the rejection, refer to a "desirable" "steamy cleaning agent" and to "steamy washing" in ¶[44]; and ¶[45] states that the boiling point needs to be higher than the substrate temperature "at the time of steamy washing;" however, since the disclosed polyorganosiloxane boils at 60 °C, any "steamy" treatment will certainly remove it and it will not remain on the surface.

Thus, in these paragraphs there is no disclosure of polyorganosiloxane being left on the surface after the steamy washing, or of any high molecular-weight straight-chain organic compound; nor is there any disclosure of leaving the substrate in a contaminating environment. There is no hint that the "steamy cleaning agent" keeps ambient organic substances from adsorbing onto the surface being cleaned, prior to a subsequent step.

Independent claims 23 is patentable for the same reasons as claims 1 and 7; the applied prior art does not disclose any method of keeping a surface clean, and does not disclose the use of high-molecular weight substances for this purpose.

Claims 20 and 22 still further distinguish by reciting that the clean room organic compounds are of lower weight than those applied to the surface by the Applicants. The prior art does not even mention ambient molecules, much less specify their weight.

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Claims 4-5 and 8-10 were rejected under §103 over JP '813 in view of Shimizu. This rejection is respectfully traversed.

As noted above, JP '813 discloses a low-molecular weight compound which boils off when exposed to steam. Shimizu discloses with high molecular weights (such compounds have high boiling points), which are intended to "have an excellent stability for a long period of time ... even when used at a high temperature" (Abstract). JP '813, which is concerned with cleaning, teaches removal of all compounds while Shimizu emphasizes that the compounds should remain. The references teach against one another.

The Examiner asserts motivation based on selecting a material to "achieve its objective" but, with respect, no objective is seen in either reference which would motivate the asserted combination, and the Examiner does not explain what the asserted objective is. Shimizu discloses no washing steps and has no relevance to JP '813.

Claims 19 and 21 were rejected under §103 over JP '813 in view of Shinozaki. This rejection is respectfully traversed. The fields of invention are seen to be disparate, teaching away from combination, and the asserted selection of suitable materials is respectfully traversed as being unsupported by either citation or reasoned argument.

Shinozaki is concerned with surface tension for generating flow, which causes a recording material to fly and be transferred onto a recording medium. With respect, this is not at all related to washing.

Respectfully submitted,

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Date

Nick Bromer

Nick Bromer (Reg. No. 33,478)
(717) 426-1664

RABIN & BERDO, P.C.
CUSTOMER NO. 23995
Telephone: (202) 371-8976
Telefax : (202) 408-0924

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